भारतीय मानक
Indian Standard

IS 15894 : 2018

गैस सिलिंडर वाल्व और सिलिंडर नैकस की शुंडाकार चूड़ियों की जाँच के लिए निरीक्षण गेज — शुंडाकार व्यास 16 अर्द्धव्यास पर 1 — विशिष्टि

(पहला पुनरीक्षण)

Inspection Gauges for Checking Taper Threads of Gas Cylinder Valves and Cylinder Necks — Taper 1 in 16 on Diameter — Specification

(First Revision)

(ICS 23.020.30)

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May 2018 **Price Group 9**

Gas Cylinders Sectional Committee, MED 16

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Gas Cylinders Sectional Committee had been approved by the Mechanical Engineering Divisional Council.

This standard was first published in 2011 by superseding IS 9121 and IS 9687. In this revision Amendment No. 1 has been incorporated, other major changes are given below:

1) Title and scope modified.
2) Oversize ¾ NGT threads (¾ NGT CL-1 to ¾ NGT CL-4) are introduced.
3) In all tables data pertaining to ¾ NGT CL-1 to CL-4 added.
4) Typographical errors and other changes which would help in implementing the Indian Standard in a better way.

Currently IS 9687 and IS 9121 are available for the gauges to check the threads of Size 1 and Size 2, respectively of IS 3224. However, no Indian Standard is available at present for the gauges to check Size 3 threads and also other NGT threads given in IS: 3224. It has, therefore, been considered necessary that a composite Indian Standard be prepared to cover the gauges to check the threads of all the sizes. Accordingly IS15894 standard is now prepared. This standard supersedes IS 9687 : 1980 'Specification for inspection gauges for checking Type 1 (Size 1) taper threads of gas cylinder valves, Taper 1 in 16' and IS 9121 : 2005 'Inspection gauges for checking Type 1 (Size 2) taper threads of gas cylinder valves, Taper 1 in 16 — Specification (*first revision*)'. Hence IS 9687 and IS 9121 shall stands withdrawn.

Taper threads of gas cylinder valve stems and cylinder necks as per Type 1 Sizes 1, 2 and 3 having taper 1 in 16 on diameter are provided in IS 3224: 2002 'Valve fittings for compressed gas cylinders excluding liquefied petroleum gas (LPG) cylinders' and Type 1 Size 2 threads are standardized in IS 8737:1995 'Valve fittings and cylinders for use with liquefied petroleum gas (LPG) cylinders of more than 5 litre water capacity'.

These threads conform to the NGT threads as per ANSI/CSA/CGA STANDARD V-1 — 1987 'Compressed gas cylinder valve outlet and inlet connection' issued by American National Standard Institute and Compressed Gas Association, Inc., this being the specification forming the basis of these threads standard. Relevant portions of the specification of the threads have been reproduced standard. With this requirement to inspect the taper of the threads, the method of checking relative engagement of the product threads in the threaded and plain taper ring gauges has been covered in this draft specification.

The relevant SI units and corresponding conversion factors are given below for guidance:

Pressure 1Pa (Pascal) = 1 N/m^2
1 kgf/mm^2= 9.80665 MPa

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

INSPECTION GAUGES FOR CHECKING TAPER THREADS OF GAS CYLINDER VALVES AND CYLINDER NECKS — TAPER 1 IN 16 ON DIAMETER — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes dimensions, tolerances and material requirement of inspection gauges recommended for checking the taper threads on valve stems and the taper threads on cylinder necks for compressed gas cylinders having a taper of 1in 16 on diameter and as given in IS 3224 and IS 8737.

NOTE — This type of thread also conforms respectively to size $^{1}/_{8,}$ $^{1}/_{4,}$$^{3}/_{8,}$ ½, ¾ and 1— NGT of ANSI/CSA/CGA STANDARD V-1 — 1987 'Compressed gas cylinder valve outlet and inlet connection', issued by American National Standard Institute and Compressed Gas Association, Inc.

2 REFERENCES

The standards listed below contain provisions, which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standard indicated below:

IS No.	*Title*
1586 (Part 1) : 2012	Metallic Material — Rockwell Hardness Test Part 1 Test method (Scales A, B, C, D, E, F, G, H, K, N, T) (*fourth revision*)
1570 (Part 2) : 1979	Schedules for wrought steels: Part 2 Carbon steels (unalloyed steels) (*first revision*)
3224 : 2002	Valve fittings for compressed gas cylinders excluding Liquefied petroleum gas (LPG) cylinders — Specification (*third revision*)
8737 : 2017	Valve fittings for use with liquefied petroleum gas (LPG) cylinders for more than 5 litre water capacity — Specification (*second revision*)

3 MATERIAL

Suitable wear resisting steel, for example 85C6 of IS 1570 (Part 2) may be used.

4 DIMENSIONS OF THREADS ON VALVE STEMS AND CYLINDERNECKS

4.1 Basic Thread Form (*see* Fig. 1 and Table 1)

4.2 Principal Dimensions (*see* Fig. 2 and Table 2)

4.3 Limits on Crest and Root Truncations (*see* Fig. 3 and Table 3)

4.4 Limits on Size

Final inspection limits on size (pitch diameter) of both external and internal threads are ±1 turn from basic, although the preferred working limits are ± ½ turn from basic.

4.5 Limits on Taper

Should there be an unintentional difference in taper at the pitch elements of the valve and of the cylinder threads; it is preferred to have greater tightness at the bottom of the valve. In view of this requirement, the limits in gauging shall be as under:

a) The taper on pitch elements of external threads shall be 1 in 16 on diameter, with a minus tolerance of one turn but no plus tolerance in gauging; and

b) The taper on pitch elements of internal threads shall be 1 in 16 on diameter, with a plus tolerance of one turn but no minus tolerance in gauging.

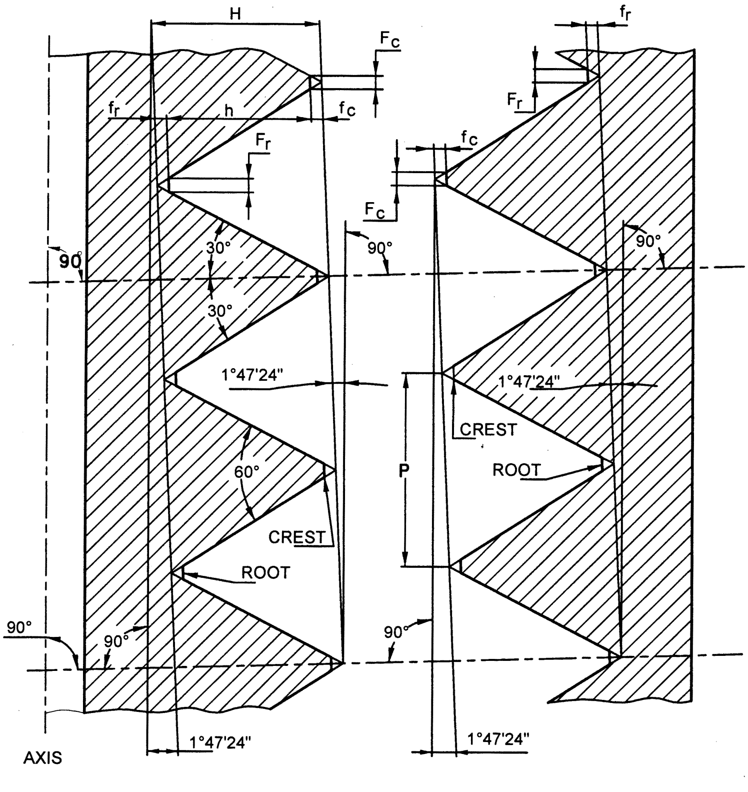
4.6 The tolerance on 60° angle of threads shall be ±2°.

4.7 The maximum taper on pitch line per millimetre shall be 0.072 9 and the minimum 0.057 3.

5 DIMENSIONS AND TOLERANCES OF GAUGES FOR CHECKING THREADS IN CYLINDER NECK (INTERNAL THREADS)

5.1 Taper Thread Plug Gauge for checking Pitch Diameter in Cylinder Neck L1 – Gauge A

See Fig. 4 and Table 4



EXTERNAL THREAD INTERNAL THREAD

All dimensions in millimetres.

FIG. 1 BASIC THREAD FORM

Table 1 Basic Thread Form

(*Clause* 4.1)

All dimensions in millimetres.

Sl No	Parameter	Thread Size ⅛ - 27 NGT	Thread Size ¼ - 18 NGT and 3/8 – 18 NGT	Thread Size ½ - 14 NGT and ¾ - 14 NGT	Thread Size ¾ - 14 NGT CL-1	Thread Size ¾ - 14 NGT CL-2	Thread Size ¾ - 14 NGT CL-3	Thread Size ¾ - 14 NGT CL-4	Thread Size 1- 11½ NGT
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	Pitch (*P*) measured parallel to axis	0.940 7	1.411	1.814	1.814	1.814	1.814	1.814	2.209
ii)	Thread angle degrees normal to axis	60	60	60	60	60	60	60	60
iii)	Taper measured on diameter along the axis	1:16	1:16	1:16	1:16	1:16	1:16	1:16	1:16
iv)	Height (*H*) of 60° sharp V thread 0.866 025*p*	0.814 6	1.222	1.571	1.571	1.571	1.571	1.571	1.913
v)	Height (*h*) of thread on product 0.800 000*p*	0.752	1.128 8	1.451 2	1.451 2	1.451 2	1.451 2	1.451 2	1.767

f_c[1] = depth of truncation at crest f_r[1] = depth of truncation at root
F_c[1] = width of flat at crest = F_r[1] = width of truncation at root

[1] For limits, *see* **4.3**

NOTE — The threads are same as 1/8 – 27 NGT, ¼ - 18 NGT, 3/8 – 18 NGT, ½ - 14 NGT, ¾ - 14 NGT , ¾ - 14 NGT (CL-1 to CL-4) and 1 - 11½ NGT threads of AMSI/CSA/CGA Standard V-1 – 1987

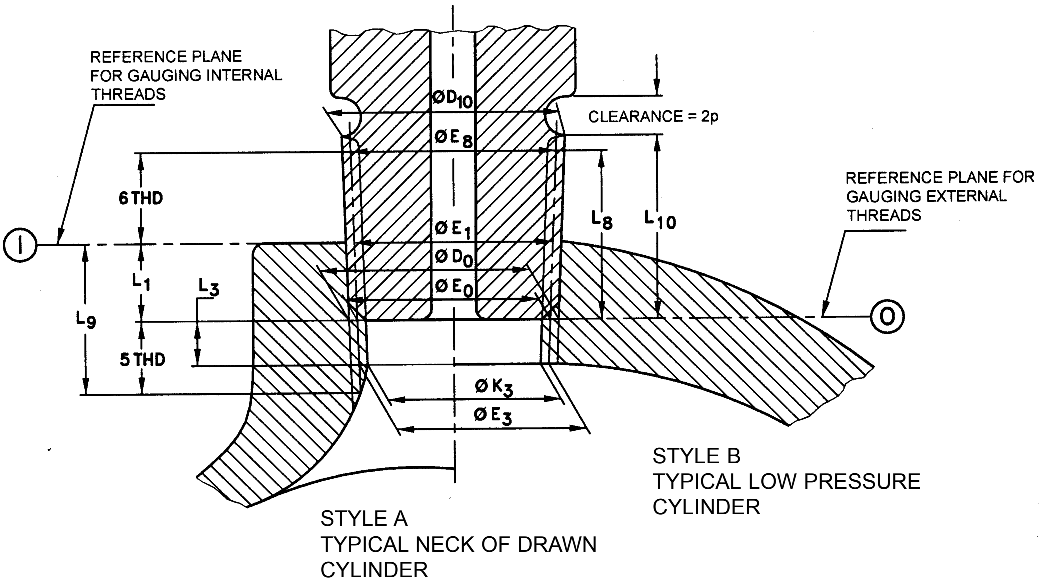

REFERENCE PLANE FOR GAUGING INTERNAL THREADS
ØD10
ØE8
CLEARANCE = 2p
REFERENCE PLANE FOR GAUGING EXTERNAL THREADS
6 THD
L8
L10
ØE1
ØD0
ØE0
I
O
L1
L3
L9
5 THD
ØK3
ØE3
STYLE B
TYPICAL LOW PRESSURE CYLINDER
STYLE A
TYPICAL NECK OF DRAWN CYLINDER

FIG. 2 PRINCIPAL DIMENSIONS

Table 2 Principal Dimensions

(*Clause* 4.2)

All dimensions in millimetres.

Sl No.	Thread Designation	Hand Tight Engagement L_1	External Threads on Valve Stem							Internal Threads on Cylinder Neck					
			Small End			Full Threads		Large End		Pitch dia at face E_1	Counter 90°X Max Dia KK	Full Threads			
			Major Dia D_o	Pitch Dia E_o	Chamfer 45° X *Min* Dia	Pitch Dia E_8	Length L_8	Major Dia D_{10} Approx	Over-all length L_{10} Approx			Bore *Max* K_3	Pitch Dia E_3	Length $L_1 + L_3$	Length of Full Root *Min* L_9
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
i)	Size ⅛ - 27 NGT	4.572	9.984	9.233	8.334	9.870	10.216	10.678	11.11	9.52	10.32	8.303	9.058	7.394	9.276
ii)	Size ¼- 18 NGT	5.08	13.253	12.126	10.716	12.972	13.546	14.046	15.875	12.443	14.288	10.732	11.862	9.314	12.136
iii)	Size ⅜ - 18 NGT	6.096	16.672	15.545	14.288	16.457	14.562	17.564	17.463	15.926	17.463	14.153	15.281	10.330	13.152
iv)	Size ½-14 NGT	8.128	20.716	19.263	17.5	20.452	19.014	21.9	20.6	19.711	22.225	17.473	18.923	13.571	17.198
v)	Size ¾-14 NGT	8.611	26.03	24.58	23	25.799	19.497	27.42	23	25.12	27	22.79	24.24	14.05	17.681
vi)	Size ¾-14 NGT CL-1	8.611	26.03	24.58	23	26.08	24.03	27.82	28.58	25.12	27	22.79	24.24	14.05	24.03
vii)	Size ¾-14 NGT CL-2	8.611	26.48	25.03	23.42	26.54	24.03	28.27	28.58	*See* Note					
viii)	Size ¾-14 NGT CL-3	8.611	27.00	25.55	23.81	27.05	24.03	28.78	28.58						
ix	Size ¾-14 NGT CL-4	8.611	27.62	26.17	24.61	27.67	24.03	29.40	28.58						
x)	Size 1- 11½ NGT	10.160	32.593	30.825	28.6	32.288	23.411	34.2	25.4	31.460	33.3	28.646	30.411	16.787	21.2

NOTE — External (CL-2 through (CL-4) threads are provided for new valves installed on used cylinders. Therefore CL-2 through CL-4 threads does not apply to internal threads. Sizes NGT ¾ (CL-1), NGT ¾ (CL-2), NGT ¾ (CL-3), and NGT ¾ (CL-4) are exclusively for chlorine cylinder valve and CL stands for chlorine.

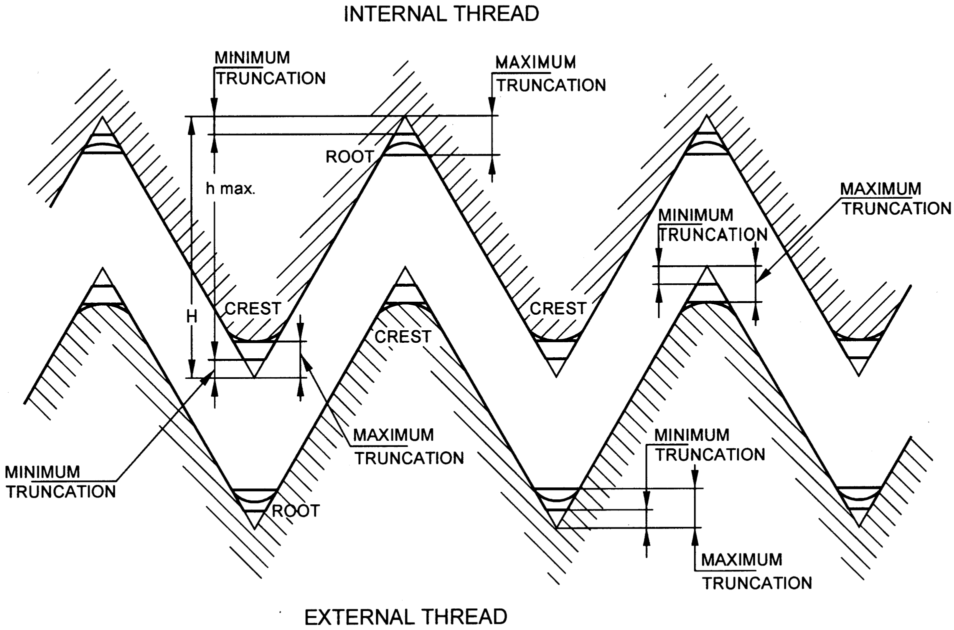


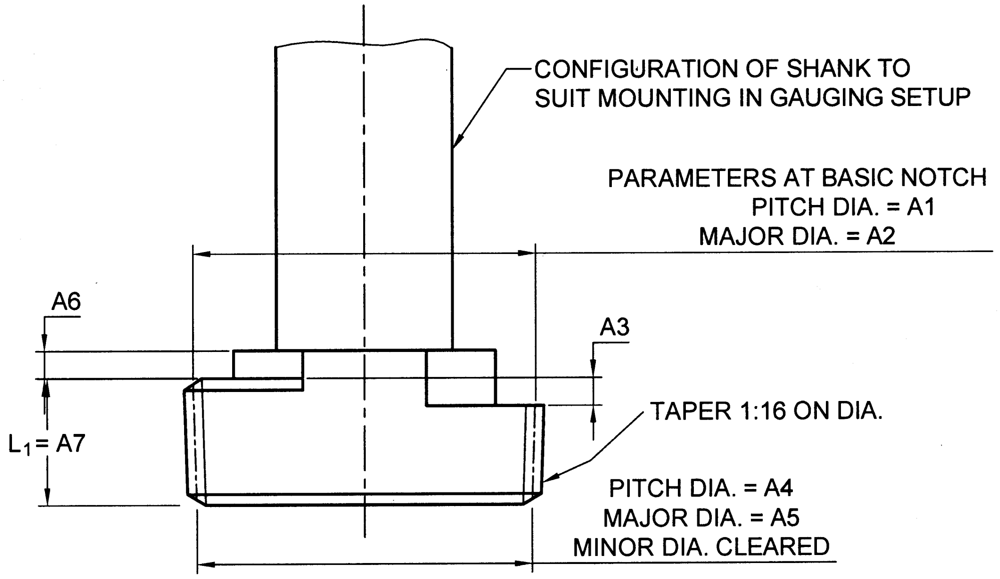
FIG. 3 LIMITS ON CREST AND ROOT TRUNCTIONS

Table 3 Limits on Crest and Root Truncations

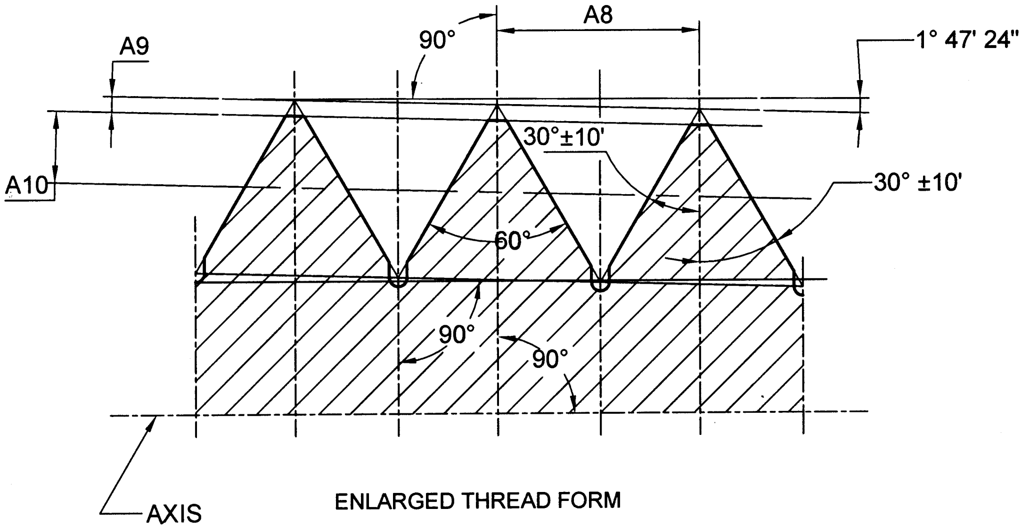
(*Clause* 4.3)

All dimensions in millimetres.

Sl No.	Parameter		Pitch (*P*)	Height (*H*) of Sharp V Thread	Height (*h*) of Threads on Product		Truncation (*f*) on crest and root			Equivalent (*F*) width of flat on crest and root		
					Maximum	Minimum	Minimum	Maximum	Tolerance	Minimum	Maximum	Tolerance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
i)	Size ⅛ - 27 NGT Thread	Formula	–	0.866 025p	0.800p	0.674p	0.033p	0.096p	–	0.038p	0.111p	–
ii)		Value	0.940 7	0.814 7	0.752 6	0.634 0	0.031	0.090 3	0.059 3	0.035 7	0.104	0.068 5
iii)	Sizes ¼ - 18 NGT and ⅜ - 18 NGT Thread	Formula	–	0.866 025p	0.800p	0.690p	0.033p	0.088p	–	0.038p	0.102p	–
iv)		Value	1.411	1.222	1.128 8	0.973 5	0.046 5	0.124 1	0.077 6	0.053 6	0.144 7	0.091 7
v)	Sizes ½ - 14 NGT and ¾ - 14 NGT Thread	Formula	–	0.866 025p	0.800p	0.710p	0.033p	0.078p	–	0.038p	0.090p	–
vi)		Value	1.814	1.571	1.451 2	1.288	0.059 8	0.141 5	0.081 7	0.068 9	0.163 29	0.093 9
vii)	Size ¾ - 14 NGT CL-1 Thread	Formula	–	0.866 025p	0.800p	0.710p	0.033p	0.078p	–	0.038p	0.090p	–
viii)		Value	1.814	1.571	1.451 2	1.288	0.059 8	0.141 5	0.081 7	0.068 9	0.163 29	0.093 9
ix)	Size ¾ - 14 NGT CL-2 Thread	Formula	–	0.866 025p	0.800p	0.710p	0.033p	0.078p	–	0.038p	0.090p	–
x)		Value	1.814	1.571	1.451 2	1.288	0.059 8	0.141 5	0.081 7	0.068 9	0.163 29	0.093 9
xi)	Size ¾ - 14 NGT CL-3 Thread	Formula	–	0.866 025p	0.800p	0.710p	0.033p	0.078p	–	0.038p	0.090p	–
xii)		Value	1.814	1.571	1.451 2	1.288	0.059 8	0.141 5	0.081 7	0.068 9	0.163 29	0.093 9
xiii)	Size ¾ - 14 NGT CL-4 Thread	Formula	–	0.866 025p	0.800p	0.710p	0.033p	0.078p	–	0.038p	0.090p	–
xiv)		Value	1.814	1.571	1.451 2	1.288	0.059 8	0.141 5	0.081 7	0.068 9	0.163 29	0.093 9
xv)	Size 1 – 11½ NGT Thread	Formula	–	0.866 025p	0.800p	0.720p	0.033p	0.073p	–	0.038p	0.084p	–
xvi)		Value	2.2087	1.912 8	1.767	1.590	0.072 8	0.161 2	0.088 4	0.083 9	0.18 55	0.101 6



Taper 1 In 16 on Diameter +0.015
Tolerance on Taper in Length L_1 = 0



Tolerance on Lead in Length L_1 = ± 0.005

Fig. 4 Taper Thread Plug Gauge to Check Pitch Diameter in Cylinder Neck, Gauge 'a' (L_1)

Table 4 Taper Thread Plug Gauge to Check Pitch Diameter in Cylinder Neck Gauge ‘A’; (L_1)

(*Clause* 5.1)

All dimensions in millimetres.

Dimensions of the gauge (*see* symbols at Fig. 4)

Sl No.	**Parameter**	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i)	Size ⅛ - 27 NGT Thread	9.52 ± 0.005	9.993	$0.947^{+0.01}_{-0}$	9.233	$9.706^{+0}_{-0.025}$	$0.947^{+0.025}_{-0}$	4.572	0.940 7	0.171	0.236 5
ii)	Size ¼ - 18 NGT Thread	12.443 ± 0.005	13.193	$1.411^{+0.015}_{-0}$	12.126	$12.876^{+0}_{-0.025}$	$1.411^{+0.025}_{-0}$	5.08	1.411	0.236	0.375
iii)	Size ⅜ - 18 NGT Thread	15.926 ± 0.005	16.676	$1.411^{+0.015}_{-0}$	15.845	$15.595^{+0}_{-0.025}$	$1.411^{+0.025}_{-0}$	6.096	1.411	0.236	0.375
iv)	Size ½ - 14 NGT Thread	19.771 ± 0.008	20.797	$1.814^{+0.025}_{-0}$	19.263	$20.829^{+0}_{-0.025}$	$1.814^{+0.025}_{-0}$	8.128	1.814	0.272	0.513
v)	Size ¾ - 14 NGT Thread	25.118 ± 0.008	26.144	$1.814^{+0.025}_{-0}$	24.580	$25.606^{+0}_{-0.025}$	$1.814^{+0.025}_{-0}$	8.611	1.814	0.272	0.513
vi)	Size ¾ - 14 NGT CL-1 Thread	25.118 ± 0.008	26.144	$1.814^{+0.025}_{-0}$	24.580	$25.606^{+0}_{-0.025}$	$1.814^{+0.025}_{-0}$	8.611	1.814	0.272	0.513
vii)	Size ¾ - 14 NGT CL-2 Thread	*See* Note Below Table 2									
viii)	Size ¾ - 14 NGT CL-3 Thread										
ix)	Size ¾ - 14 NGT CL-4 Thread										
x)	Size 1 - 11½ NGT Thread	31.460 ± 0.008	30.21	$2.209^{+0.025}_{-0}$	30.825	$32.075^{+0}_{-0.025}$	$2.209^{+0.025}_{-0}$	10.160	2.208 7	0.331	0.625

5.2 Full Form Taper Thread Plug Gauge for checking engagement of threads in Cylinder Neck L_9 — Gauge B

See Fig. 5 and Table 5.

5.3 Plain Taper Plug Gauge for Checking Crest Truncations of Thread in Cylinder Neck Gauge C

see Fig. 6 and Table 6.

6 DIMENSIONS AND TOLERANCES OF GAUGES FOR CHECKING THREADS ON TAPER STEMS (EXTERNAL THREADS)

6.1 Taper Screw Ring Gauge for Checking Pitch Diameter of Threads on Taper Stem in length L_1 — Gauge *D*

see Fig. 7 and Table 7.

6.2 Full Form Screw Ring Gauge for checking relative engagement of threads of Taper Stem L_8 — Gauge *E*

See Fig. 8.

6.3 Plain Taper Ring Gauge for checking Crest Truncation of External Threads on stem — Gauge *F*

See Fig. 9 and Table 9.

7 DIMENSIONS AND TOLERANCES OF MASTER GAUGES

7.1 Master Taper Screw Ring Gauge to check L1 (Gauge A) and L9 (Gauge B) Taper Thread Plug Gauges — Gauge M-INT

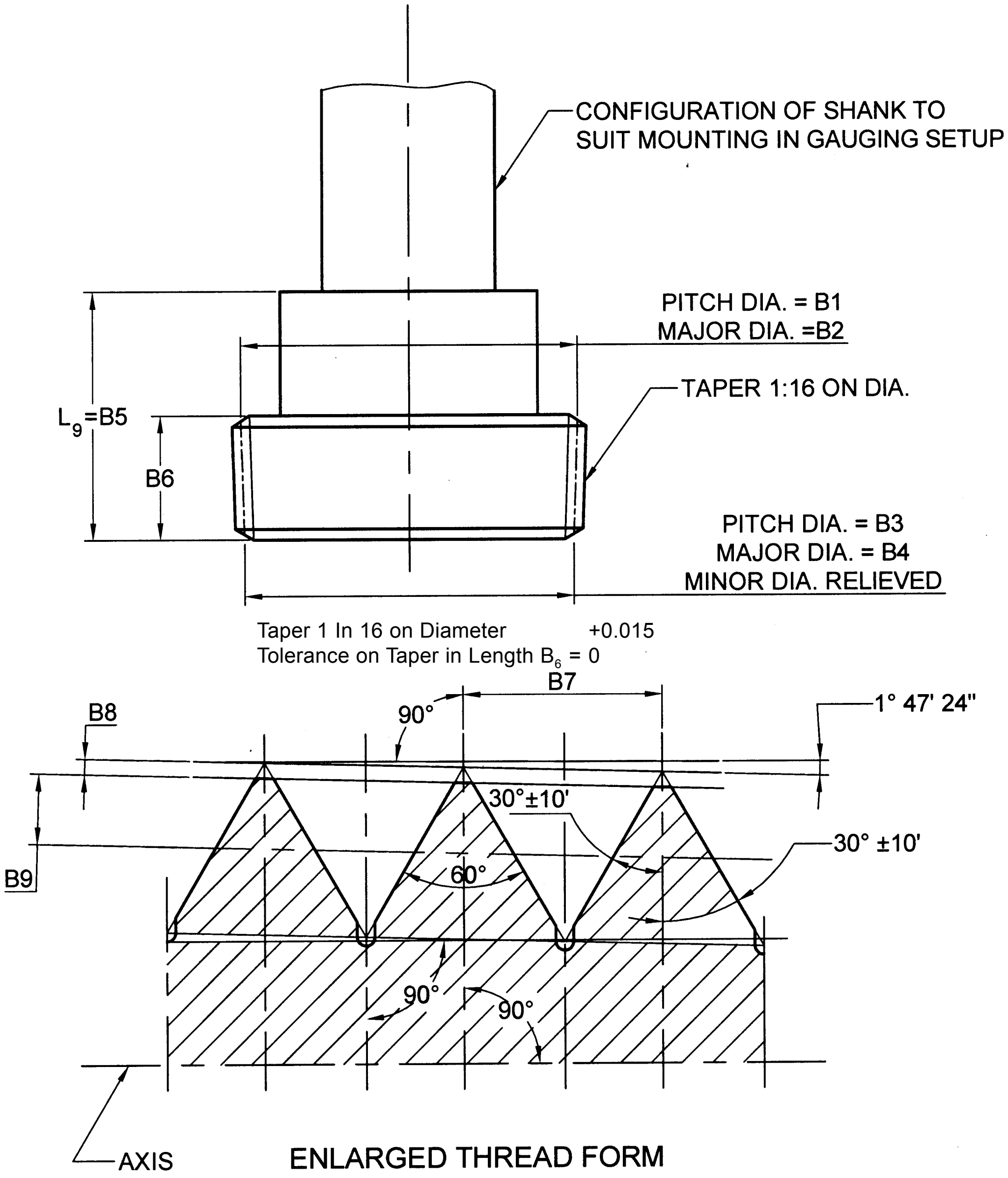
See Fig. 10 and Table 10.

7.2 Master Taper Thread Plug Gauge to Check L_1 (Gauge D) and L_8 (Gauge E) Taper Screw Ring Gauges — Gauge M-EXT

See Fig. 11 and Table 11.

8 USAGE OF GAUGES

Usage of gauges is given in Annex A.



Taper 1 In 16 on Diameter $\quad +0.015$

Tolerance on Taper in Length B_6 = 0

ENLARGED THREAD FORM

Tolerance of Lead in Length B_6 = ± 0.005

FIG. 5 FULL FORM TAPER THREAD PLUG GAUGE TO CHECK THREAD IN CYLINDER NECK GAUGE 'B' (L_9)

Table 5 Full Form Taper Thread Plug Gauge to Check Thread in Cylinder Neck Gauge 'B' (L_9)

(*Clause* 5.2)

All dimensions in millimetres.

Dimensions of the gauge (*see* symbols at Fig. 5)

Sl No.	Parameter	B1	B2	B3	B4	B5	B6	B7	B8	B9
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
i)	Size ⅛ – 27 NGT Thread	9.233 ± 0.005	9.901	8.940	$9.608^{+0}_{-0.025}$	$9.276^{+0}_{-0.025}$	4.70	0.940 7	0.073	0.334
ii)	Size ¼ - 18 NGT Thread	12.126 ± 0.005	13.126	11.684	$12.684^{+0}_{-0.025}$	$12.136^{+0}_{-0.025}$	7.06	1.411	0.111	0.500
iii)	Size ⅜ - 18 NGT Thread	15.845 ± 0.005	16.845	15.104	$16.104^{+0}_{-0.025}$	$13.152^{+0}_{-0.025}$	7.06	1.411	0.111	0.500
iv)	Size ½ - 14 NGT Thread	19.263 ± 0.008	20.551	18.696	$19.982^{+0}_{-0.025}$	$17.198^{+0}_{-0.025}$	9.070	1.814	0.142	0.643
v)	Size ¾ - 14 NGT Thread	24.58 ± 0.008	25.865	24.013	$25.299^{+0}_{-0.025}$	$17.681^{+0}_{-0.025}$	9.070	1.814	0.142	0.643
vi)	Size ¾ - 14 NGT CL-1 Thread	24.58 ± 0.008	25.865	23.62	$24.90^{+0}_{-0.025}$	$24.03^{+0}_{-0.025}$	15.42	1.814	0.142	0.643
vii)	Size ¾ - 14 NGT CL-2 Thread	*See* Note Below Table 2								
viii)	Size ¾ - 14 NGT CL-3 Thread									
ix)	Size ¾ - 14 NGT CL-4 Thread									
x)	Size 1 –11½ NGT Thread	30.825 ± 0.008	32.393	30.135	$31.704^{+0}_{-0.025}$	$21.2^{+0}_{-0.025}$	11.043	2.208 7	0.172	0.783

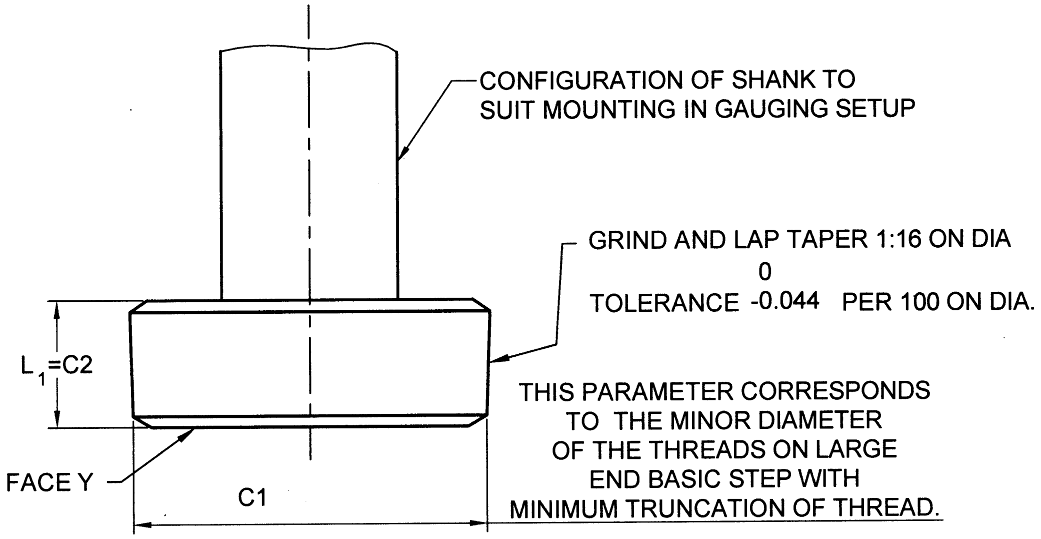

CONFIGURATION OF SHANK TO
SUIT MOUNTING IN GAUGING SETUP
GRIND AND LAP TAPER 1:16 ON DIA
0
TOLERANCE -0.044 PER 100 ON DIA.
L1=C2
THIS PARAMETER CORRESPONDS
TO THE MINOR DIAMETER
OF THE THREADS ON LARGE
END BASIC STEP WITH
MINIMUM TRUNCATION OF THREAD.
FACE Y
C1

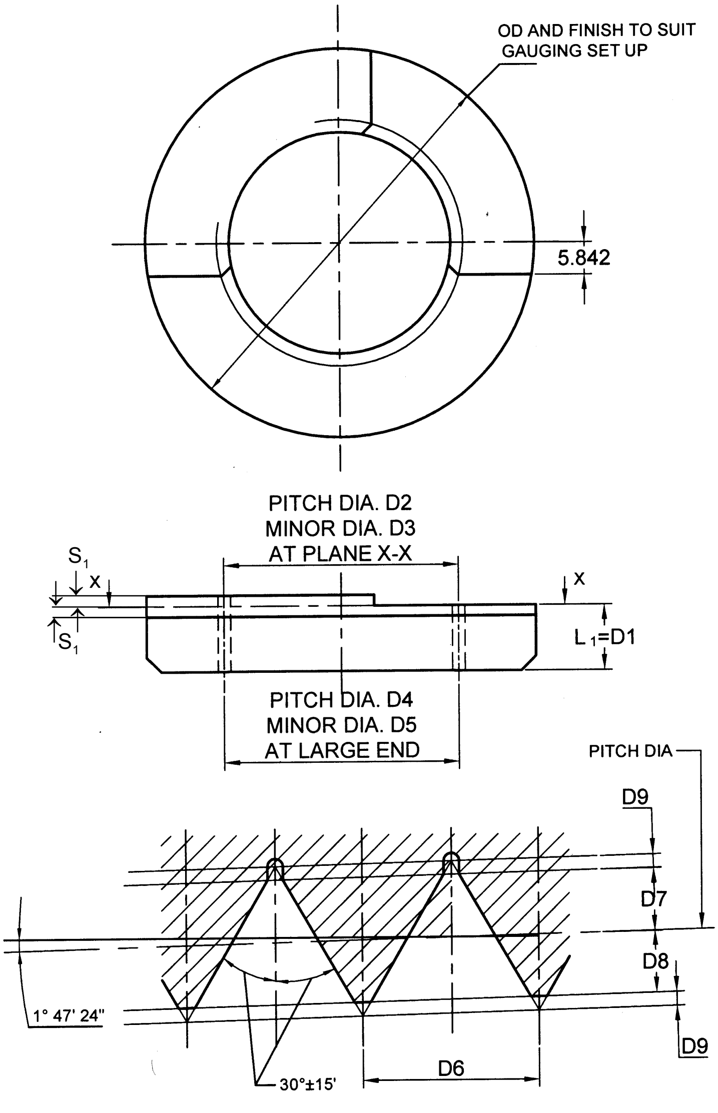
FIG. 6 PLAIN TAPER PLUG GAUGE TO CHECK CREST TRUNCATION IN CYLINDER NECK GAUGE 'C'

Table 6 Plain Taper Plug Gauge to Check Crest Truncation in Cylinder Neck Gauge 'C'

(*Clause* 5.3)

All dimensions in millimetres.
Dimensions of the gauge (*see* symbols in Fig. 6)

Sl No.	Parameter	Thread Size ⅛ – 27 NGT	Thread Size ¼ - 18 NGT	Thread Size ⅜ - 18 NGT	Thread Size ½ - 14 NGT	Thread Size ¾ - 14 NGT	Thread Size ¾ - 14 NGT CL-1	Thread Size ¾ - 14 NGT CL-2	Thread Size ¾ - 14 NGT CL-3	Thread Size ¾ - 14 NGT CL-4	Thread Size 1 – 11½ NGT
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i)	C1	$8.480^{+0}_{-0.005}$	$10.997^{+0}_{-0.005}$	$14.76^{+0}_{-0.005}$	$17.81^{+0}_{-0.005}$	$23.129^{+0}_{-0.005}$	$23.129^{+0}_{-0.005}$	*See* Note Below Table 2			$29.058^{+0}_{-0.005}$
ii)	C2	4.572 ±0.038	5.08 ±0.038	6.096 ±0.038	8.128 ±0.038	8.611 ±0.038	8.611 ±0.038				10.160 ±0.038



Taper 1 In 16 on Diameter +0
Tolerance on Taper in Length L_1 = -0.023
Right Hand Thread Normal to the Axis
Tolerance of Lead in Length L_1 = ±0.008

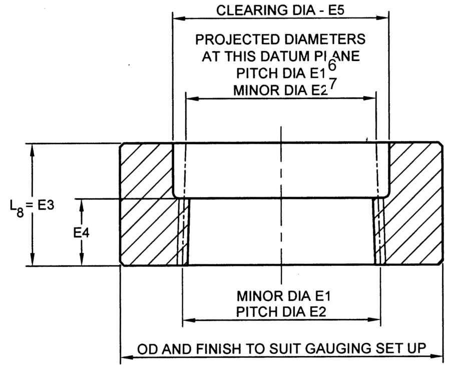
FIG. 7 TAPER SCREW RING GAUGE TO CHECKTAPER THREADS ON VALVE STEM, GAUGE 'D' (L_1)

Table 7 Taper Screw Ring Gauge to Check Taper Threads on Valve Stem Gauge 'D' (L_1)

All dimensions in millimetres.

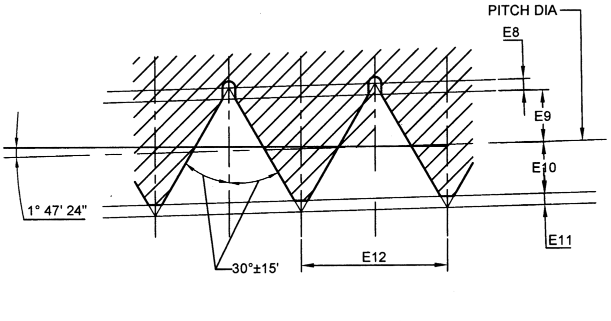
Dimensions of the gauge (*see* symbols at Fig. 7)

Sl No.	Parameter	D1	D2	D3	D4	D5	D6	D7	D8	D9	S1
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i)	Size ⅛ – 27 NGT Thread	$4.572^{+0.025}_{-0}$	9.233	8.76	9.520	$9.047^{+0.01}_{-0}$	0.9407	0.2365	0.2365	0.171	$0.941^{+00.0}_{-0.010}$
ii)	Size ¼ - 18 NGT Thread	$5.08^{+0.025}_{-0}$	12.126	11.376	12.443	$11.693^{+0.015}_{-0}$	1.411	0.375	0.375	0.236	$1.411^{+0.0}_{-0.010}$
iii)	Size ⅜ - 18 NGT Thread	$6.096^{+0.025}_{-0}$	15.845	15.095	15.926	$15.176^{+0.015}_{-0}$	1.411	0.375	0.375	0.236	$1.411^{+0.0}_{-0.015}$
iv)	Size ½ - 14 NGT Thread	$8.128^{+0.025}_{-0}$	19.263	18.236	19.771	$18.745^{+0.025}_{-0}$	1.814	0.513	0.513	0.272	$1.814^{+0.0}_{-0.015}$
v)	Size ¾ - 14 NGT Thread	$8.611^{+0.025}_{-0}$	24.58	23.553	25.118	$24.092^{+0.025}_{-0}$	1.814	0.513	0.513	0.272	$1.814^{+0.0}_{-0.020}$
vi)	Size ¾ - 14 NGT CL-1 Thread	$8.611^{+0.025}_{-0}$	24.58	23.553	25.118	$24.092^{+0.025}_{-0}$	1.814	0.513	0.513	0.272	$1.814^{+0.0}_{-0.020}$
vii)	Size ¾ - 14 NGT CL-2 Thread	$8.611^{+0.025}_{-0}$	25.034	24.008	25.572	$24.546^{+0.025}_{-0}$	1.814	0.513	0.513	0.272	$1.814^{+0.0}_{-0.020}$
viii)	Size ¾ - 14 NGT CL-3 Thread	$8.611^{+0.025}_{-0}$	25.545	24.519	26.083	$25.057^{+0.025}_{-0}$	1.814	0.513	0.513	0.272	$1.814^{+0.0}_{-0.020}$
ix)	Size ¾ - 14 NGT CL-4 Thread	$8.611^{+0.025}_{-0}$	26.167	25.141	26.705	$25.679^{+0.025}_{-0}$	1.814	0.513	0.513	0.272	$1.814^{+0.0}_{-0.020}$
x)	Size 1 –11½ NGT Thread	$10.160^{+0.025}_{-0}$	30.825	29.575	31.460	$30.21^{+0.025}_{-0}$	2.2087	0.625	0.625	0.331	$2.209^{+0.0}_{-0.025}$



Taper 1 In 16 on Diameter +0

Tolerance on Taper in Length E_4 = −0.023



ENLARGED THREAD FORM

Right Hand Thread Normal to the Axis

Tolerance of Lead in Length E_4 = ±0.008

FIG. 8 FULL FORM TAPER SCREW RING GAUGE TO CHECK THREADS ON VALVE STEM, GAUGE 'E' (L_8)

Table 8 Full Form Taper Screw Ring Gauge to Check Thread in Valve Stem Gauge 'E' (L_8)

All dimensions in millimetres.

Dimensions of the gauge (*see* symbols at Fig. 8)

Sl No.	Parameter	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
i)	Size ⅛ – 27 NGT Thread	$9.202^{+0.025}_{-0}$	9.870	$10.216^{+0.025}_{-0}$	5.64	11.1	9.233	8.565	0.073	0.334	0.334	0.073	0.9407
ii)	Size ¼ - 18 NGT Thread	$11.972^{+0.025}_{-0}$	12.972	$13.546^{+0.025}_{-0}$	8.47	14.8	12.126	11.126	0.111	0.500	0.500	0.111	1.411
iii)	Size ⅜ - 18 NGT Thread	$15.457^{+0.025}_{-0}$	16.457	$14.562^{+0.025}_{-0}$	8.47	18.2	15.545	14.545	0.111	0.500	0.500	0.111	1.411
iv)	Size ½ - 14 NGT Thread	$19.166^{+0.025}_{-0}$	20.452	$19.014^{+0.025}_{-0}$	10.886	22.5	19.263	17.975	0.142	0.643	0.643	0.142	1.814
v)	Size ¾ - 14 NGT Thread	$24.513^{+0.025}_{-0}$	25.799	$19.497^{+0.025}_{-0}$	10.886	27.9	24.58	23.294	0.142	0.643	0.643	0.142	1.814
vi)	Size ¾ - 14 NGT CL-1 Thread	$24.796^{+0.025}_{-0}$	26.082	$24.031^{+0.025}_{-0}$	15.42	27.9	24.58	23.294	0.142	0.643	0.643	0.142	1.814
vii)	Size ¾ - 14 NGT CL-2 Thread	$25.250^{+0.025}_{-0}$	26.536	$24.031^{+0.025}_{-0}$	15.42	28.4	25.03	23.748	0.142	0.643	0.643	0.142	1.814
viii)	Size ¾ - 14 NGT CL-3 Thread	$25.761^{+0.025}_{-0}$	27.047	$24.031^{+0.025}_{-0}$	15.42	28.9	25.545	24.258	0.142	0.643	0.643	0.142	1.814
ix)	Size ¾ - 14 NGT CL-4 Thread	$26.383^{+0.025}_{-0}$	27.669	$24.031^{+0.025}_{-0}$	15.42	29.5	26.167	24.882	0.142	0.643	0.643	0.142	1.814
x)	Size 1 –11½ NGT Thread	$30.72^{+0.025}_{-0}$	32.288	$23.411^{+0.025}_{-0}$	13.252	34.7	30.825	29.257	0.172	0.784	0.784	0.172	2.2087

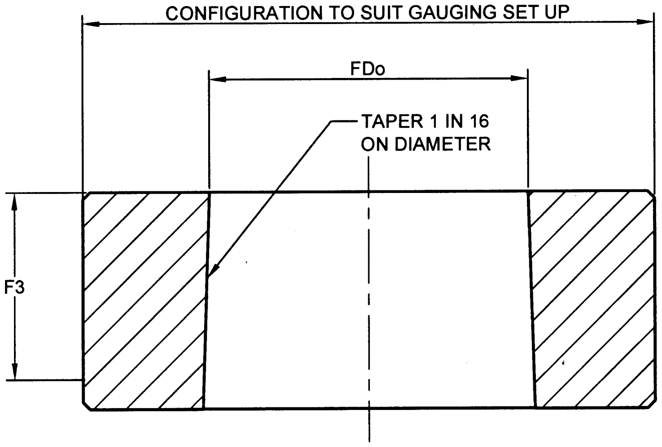

CONFIGURATION TO SUIT GAUGING SET UP
FDo
TAPER 1 IN 16 ON DIAMETER
F3

FIG. 9 PLAIN TAPER RING GAUGE TO CHECK CREST TRUNCATION OF EXTERNAL THREADS, GAUGE 'F'

Table 9 Plain Taper Ring Gauge to Check Crest Truncation of External Thread Gauge 'F'

All dimensions in millimetres (see symbols at Fig. 9).

Sl No.	Parameter	Thread Size ⅛ – 27 NGT	Thread Size ¼ - 18 NGT	Thread Size ⅜ – 18 NGT	Thread Size ½ - 14 NGT	Thread Size ¾ - 14 NGT	Thread Size ¾ - 14 NGT CL-1	Thread Size ¾ - 14 NGT CL-2	Thread Size ¾ - 14 NGT CL-3	Thread Size ¾ - 14 NGT CL-4	Thread Size 1 – 11½ NGT
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i)	FDo	$9.985^{+0}_{-0.005}$	$13.254^{+0}_{-0.005}$	$16.673^{+0}_{-0.005}$	$20.716^{+0}_{-0.005}$	$26.030^{+0}_{-0.005}$	$26.030^{+0}_{-0.005}$	$26.485^{+0}_{-0.005}$	$26.995^{+0}_{-0.005}$	$27.617^{+0}_{-0.005}$	$32.593^{+0}_{-0.005}$
ii)	F_3	4.572 ±0.025	5.080 ±0.025	6.096 ±0.025	8.128 ±0.025	8.611 ±0.025	8.611 ±0.025	8.611 ±0.025	8.611 ±0.025	8.611 ±0.025	10.160 ±0.025

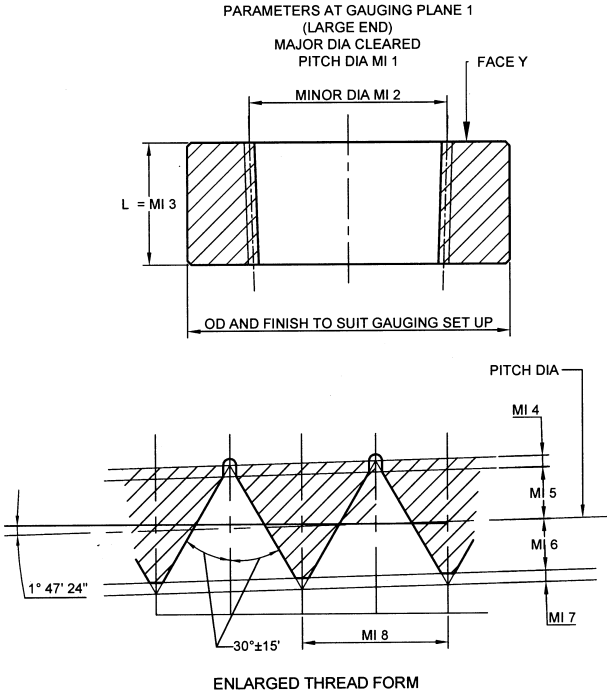


FIG. 10 MASTER TAPER SCREWS RING GAUGE, M-INTERNAL

Table 10 Master Taper Screw Ring Gauge M-INT

All dimensions in millimetres.

Dimensions of the Gauge (*see* symbols in Fig. 10)

Sl No.	Parameter	MI 1	MI 2	MI 3	MI 4	MI 5	MI 6	MI 7	MI 8	MI 9	MI 10	MI 11
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
i)	Size ⅛ – 27 NGT Thread	9.520 ±0.005	$8.9874^{+0.025}_{-0}$	$9.276^{+0.025}_{-0}$	0.204	0.2034	0.2663	0.141	0.9407	$^{+0.015}_{-0}$	± 0.005	0.47
ii)	Size ¼ - 18 NGT Thread	12.443 ± 0.005	$11.643^{+0.025}_{-0}$	$12.136^{+0.025}_{-0}$	0.306	0.305	0.400	0.211	1.411	$^{+0.015}_{-0}$	± 0.005	0.70
iii)	Size ⅜ - 18 NGT Thread	15.926 ± 0.005	$15.126^{+0.025}_{-0}$	$13.152^{+0.025}_{-0}$	0.306	0.305	0.400	0.211	1.411	$^{+0.015}_{-0}$	± 0.005	0.70
iv)	Size ½ - 14 NGT Thread	19.771 ± 0.008	$18.745^{+0.025}_{-0}$	$17.198^{+0.025}_{-0}$	0.394	0.394	0.513	0.272	1.814	$^{+0.015}_{-0}$	± 0.005	0.9
v)	Size ¾ - 14 NGT Thread	25.118 ± 0.008	$24.1^{+0.025}_{-0}$	$17.681^{+0.025}_{-0}$	0.394	0.394	0.513	0.272	1.814	$^{+0.015}_{-0}$	± 0.005	0.9
vi)	Size ¾ - 14 NGT CL-1 Thread	25.118 ± 0.008	$24.1^{+0.025}_{-0}$	$24.03^{+0.025}_{-0}$	0.394	0.394	0.513	0.272	1.814	$^{+0.015}_{-0}$	± 0.005	0.9
vii)	Size ¾ - 14 NGT CL-2 Thread	*See* Note Below Table 2										
viii)	Size ¾ - 14 NGT CL-3 Thread											
ix)	Size ¾ - 14 NGT CL-4 Thread											
x)	Size 1 –11½ NGT Thread	31.460 ± 0.008	$30.21^{+0.025}_{-0}$	$21.2^{+0.025}_{-.0}$	0.48	0.48	0.625	0.331	2.2087	$^{+0.015}_{-0}$	±0.005	1.1

Taper 1 in 16 diameter; tolerance in taper on length L_1 = MI 9; Right hand thread normal to axis; Tolerance of lead in length L_1 = MI 10.

NOTE — The maximum permissible wear on taper thread plug gauges L_1 and L_9 shall be equivalent to ½ turn from basic. Accordingly, basic reference plane of master taper screw ring gauge (Gauge M-INT) shall protrude by maximum MI 11 (see the table above) from the basic step of the Plug Gauges L_1 and L_9. The setting of the dial indicators in the gauging set up (*see* Fig. 13) shall be done with reference to the basic reference face of the master taper screw ring gauge (Gauge M-INT).

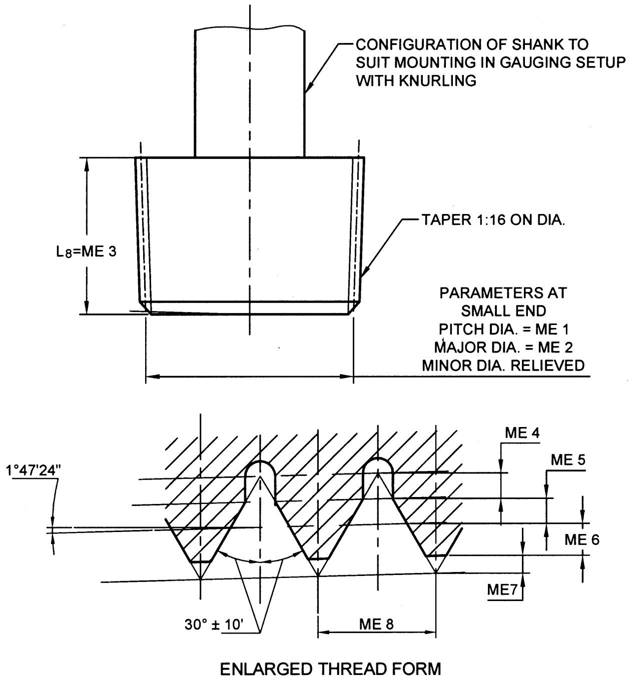


FIG. 11 MASTER TAPER THREAD PLUG GAUGE, M-EXTERNAL

Table 11 Master Taper Thread Plug Gauge M-EXT

All dimensions in millimetres.

Dimensions of the Gauge (*see* symbols in Fig. 11)

Sl No.	Parameter	ME 1	ME 2	ME 3	ME 4	ME 5	ME 6	ME 7	ME 8	ME 9	ME 10	ME 11
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
i)	Size $\frac{1}{8}$ - 27 NGT Thread	9.233 ± 0.005	$9.706^{+0}_{-0.025}$	$10.216^{+0.025}_{-0}$	0.204	0.204	0.2365	0.141	0.9407	$^{+0.008}_{-0}$	±0.005	0.47
ii)	Size ¼ - 18 NGT Thread	12.126 ± 0.005	$12.876^{+0}_{-0.025}$	$13.546^{+0.025}_{-0}$	0.306	0.306	0.375	0.211	1.411	$^{+0.01}_{-0}$	±0.005	0.70
iii)	Size $\frac{3}{8}$ - 18 NGT Thread	15.545 ± 0.005	$16.295^{+0}_{-0.025}$	$14.562^{+0.025}_{-0}$	0.306	0.306	0.375	0.211	1.411	$^{+0.01}_{-0}$	±0.005	0.70
iv)	Size ½ - 14 NGT Thread	19.263 ± 0.008	$20.289^{+0}_{-0.025}$	$19.041^{+0.025}_{-0}$	0.394	0.394	0.513	0.272	1.814	$^{+0.015}_{-0}$	±0.005	0.9
v)	Size ¾ - 14 NGT Thread	24.58 ± 0.008	$25.606^{+0}_{-0.025}$	$19.497^{+0.025}_{-0}$	0.394	0.394	0.513	0.272	1.814	$^{+0.015}_{-0}$	±0.005	0.9
vi)	Size ¾ - 14 NGT CL-1 Thread	24.58 ± 0.008	$25.606^{+0}_{-0.025}$	$24.031^{+0.025}_{-0}$	0.394	0.394	0.513	0.272	1.814	$^{+0.015}_{-0}$	±0.005	0.9
vii)	Size ¾ - 14 NGT CL-2 Thread	25.034 ± 0.008	$26.061^{+0}_{-0.025}$	$24.031^{+0.025}_{-0}$	0.394	0.394	0.513	0.272	1.814	$^{+0.015}_{-0}$	±0.005	0.9
viii)	Size ¾ - 14 NGT CL-3 Thread	25.545 ± 0.008	$26.571^{+0}_{-0.025}$	$24.031^{+0.025}_{-0}$	0.394	0.394	0.513	0.272	1.814	$^{+0.015}_{-0}$	±0.005	0.9
ix)	Size ¾ - 14 NGT CL-4 Thread	26.167 ± 0.008	$27.194^{+0}_{-0.025}$	$24.031^{+0.025}_{-0}$	0.394	0.394	0.513	0.272	1.814	$^{+0.015}_{-0}$	±0.005	0.9
x)	Size 1 –11½ NGT Thread	30.825 ± 0.008	$32.075^{+0}_{-0.025}$	$23.411^{+0.025}_{-0}$	0.48	0.48	0.625	0.331	2.2087	$^{+0.015}_{-0}$	±0.008	1.1

Taper 1 in 16 diameter; tolerance in taper on length L_1 = ME 9; Right hand thread normal to axis; Tolerance of lead in length L_1 = ME 10

NOTE — The maximum permissible wear on taper thread ring gauges L_1 and L_8 shall be equivalent to ½ turn from basic. Accordingly, basic reference plane of master taper screw plug gauge (Gauge M-EXT) shall protrude by maximum ME 11 (*see* the table above) from the basic step of the Ring Gauges L_1 and L_8. The setting of the dial indicators in the gauging set up (*see* Fig. 12) shall be done with reference to the basic reference face of the master taper screw plug gauge.

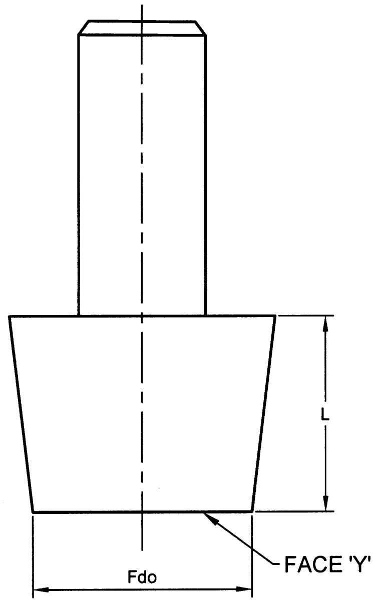


FIG. 12 MASTER SETTING PLUG GAUGE FOR CHECKING TRUNCATION GAUGE 'F'

Table 12 Master Setting Plug Gauge for Checking Truncation Gauge 'F'

All dimensions in millimetres

(*see* symbols in Fig. 12 above)

Sl No.	Para-meter	Thread Size ⅛ - 27 NGT	Thread Size ¼ - 18 NGT	Thread Size ⅜ - 18 NGT	Thread Size ½ - 14 NGT	Thread Size ¾ - 14 NGT	Thread Size ¾ - 14 NGT CL-1	Thread Size ¾ - 14 NGT CL-2	Thread Size ¾ - 14 NGT CL-3	Thread Size ¾ - 14 NGT CL-4	Thread Size 1 – 11½ NGT
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i)	Fd_0	$9.983^{+0}_{-0.025}$	$13.252^{+0}_{-0.025}$	$16.671^{+0}_{-0.025}$	$20.714^{+0}_{-0.025}$	$26.028^{+0}_{-0.025}$	$26.028^{+0}_{-0.025}$	$26.483^{+0}_{-0.025}$	$26.993^{+0}_{-0.025}$	$27.615^{+0}_{-0.025}$	$32.591^{+0}_{-0.025}$
ii)	L(Min)	6.0	6.5	7.5	9.5	10.0	10.0	10.0	10.0	10.0	11.5

NOTES

1 Fd_0 corresponds to Major diameter Do (Basic). Alternate design to suit any other step on the Truncation Gauge shall be permitted.

2 Truncation Gauge F having 6 steps as given in IS: 9121 shall be an alternate design to gauge F given in Fig. 9 of this standard.

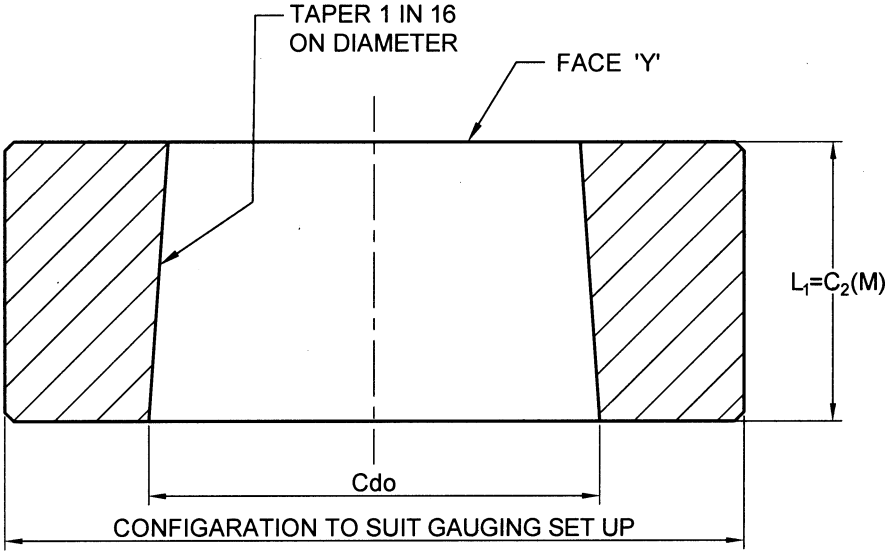


FIG. 13 MASTER SETTING RING GAUGE FOR CHECKING TRUNCATION GUAGE 'C'

Table 13 Master Setting Ring Gauge for Checking Truncation Gauge 'C'

All dimensions in millimetres.

Sl No.	Parameter	Thread Size ⅛ – 27 NGT	Thread Size ¼ - 18 NGT	Thread Size ⅜ - 18 NGT	Thread Size ½ - 14 NGT	Thread Size ¾ - 14 NGT	Thread Size ¾ - 14 NGT CL-1	Thread Size ¾ - 14 NGT CL-2	Thread Size ¾ - 14 NGT CL-3	Thread Size ¾ - 14 NGT CL-4	Thread Size 1 – 11½ NGT
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)			(10)
i)	Cd_0	$8.480^{+0.005}_{-0}$	$10.997^{+0.005}_{-0}$	$14.76^{+0.005}_{-0}$	$17.81^{+0.005}_{-0}$	$23.129^{+0.005}_{-0}$	$23.129^{+0.005}_{-0}$	*See* Note Below Table 2			$29.058^{+0.005}_{-0}$
ii)	C_2 (M)	4.572 ± 0.038	5.08 ± 0.038	6.096 ± 0.038	8.128 ± 0.038	8.611 ± 0.038	8.611 ± 0.038				10.160 ± 0.038

9 GENERAL REQUIREMENTS OF GAUGING SURFACES

9.1 Hardness

Rockwell C 60 to 62 when determined according to IS 1586 (Part 1).

9.2 Finish

Gauging surfaces shall be ground and suitably stabilized. The method of stabilizing shall be as per agreement between the manufacturer and the customer. Surfaces other than the gauging surface shall be finished smooth.

10 DESIGNATION

The gauges shall be designated by:

Size of the thread, gauge type and number of this standard.

Example:

The screw ring gauge for checking pitch diameter of taper stem at length L_1 shall be designated as:

¾″ × 14NGTL1 Gauge D, IS 15894

11 CORROSION PROTECTION AND PACKING

Gauges shall be protected against climatic conditions by application of any anti-corrosive coating. Packing shall be suitable to prevent damage in transit.

12 MARKING

12.1 The gauge shall be marked with the following:

a) Designation,
b) Manufacturer's name or trade-mark, and
c) Serial number.

12.2 BIS Certification Marking

Each gauge may also be marked with the Standard Mark.

12.2.1 The use of Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the license for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A

(*Clause* 8)

USAGE OF GAUGES

A-0 Special gauges are required for the gauging of these threads because of their length and rigid requirement for sealing the compressed gas against leakage.

A-1 PITCH DIAMETER OF EXTERNAL THREAD

To check the size of external thread for pitch diameter, the taper screw ring gauge *D* is used. This gauge *D* (also known as L_1 ring gauge) is the primary gauge because the reading taken on this gauge will be needed for use when additional gauging is done.

A-1.1 The taper screw ring gauge *E* (also known as L_8 ring gauge) is used to check the taper of the external threads. It is screwed on to the valve stem thread and its engagement relative to that of L_1 ring read at **A-1** is noted.

A-2 CREST TRUNCATION OF EXTERNAL THREAD

To check the crest truncation of external thread, the plain taper ring gauge *F* (also known as truncation gauge) is used. This gauge is placed over the taper thread and the engagement relative to that of L_1 ring read at **A-1** is noted.

A-3 Gauging of the thread with the three ring gauges (*see* Figs. 7 to 9) is illustrated hereunder:

a) To set the L_1 and L_8 taper screw ring gauges (gauges *D* and *E* respectively), use the master taper thread plug gauge M-EXT (*see* Table 11) screwed into the rings and set the reading on the dial indicator at zero with the plunger tip on the indicator resting against small end of the master taper thread plug ensuring that the whole millimeter readings on the small dials is also equal on both the dials.

b) The master taper thread plug gauge be then unscrewed till the small end of the gauge matches with the basic reference face of the L_1 and L_8 gauges. The dial readings shall be recorded and compared with the set value as in **A-3** a). The difference shall be maximum ME11 (*see* Table 10).

c) To set the plain taper truncation ring (gauge *F*), insert the Master Plain Check Plug Gauge (*see* Fig. 12) in to the gauge. Set the plunger tip of the dial indicator against the face '*Y*' of the Check plug and adjust the dial at zero ensuring that the whole millimeter readings on the small dial is identical to that on the small dials of the two gauges as given in **A-3**(a).

d) Repeat Step (b) for truncation gauge also.

e) Screw the valve stem in taper screw ring D and note the reading on dial indicator. The reading should be zero (as set on the dial indicator) ± A-3(c) (*see* Table 14 for value) mm for the purpose of acceptability of the thread size. Note this reading as R(Ext)L1

f) Screw the valve stem into gauge E. The reading on the dial indicator should be $\mathrm{R}_{(\mathrm{Ext})\mathrm{L1}}{}^{+\mathrm{A-3(d)1}}_{-0}$ (*see* Table 14 for value) for the purpose of acceptability of the requirement of relative engagement (*see* **4.5**).

g) Place the valve stem in to the plain taper ring gauge F. The reading on the dial Indicator should be $\mathrm{R}(\mathrm{Ext})_{\mathrm{L1}}{}^{+\mathrm{A-3(e)1}}_{-0}$ (*see* Table 14 for value) for the purpose of acceptability of the crest truncation of the thread.

A-4 PITCH DIAMETER OF INTERNAL THREAD

To check the size of the internal thread for pitch diameter, the taper thread plug gauge A is used. This gauge A (also known as L_1 plug gauge) is the primary gauge because the reading taken on this gauge will be needed for use when additional gauging is done.

A-4.1 The gauge B (also known as L_9 plug gauge) is used to check the engagement relative to that with L_1 plug.

A-5 CREST TRUNCATION OF INTERNAL THREAD

To check the crest truncation of the internal thread, the plain taper plug gauge C (also known as truncation gauge) is used. This gauge is placed in to the internal thread and the engagement relative to that with L_1 plug is checked.

A-6 The gauging of the internal threads with these gauges as stated above is illustrated hereunder with reference to Fig. 13:

a) Using the master taper screw ring shown in Fig. 10 and the plunger tips of the respective dial indicators resting against the face 'Y' of the master ring, set the readings on dial indicators of L_1 and L_9 gauges at zero ensuring that the whole millimeter readings on the small dials is also equal on both the dials

b) The master taper screw ring gauge be then unscrewed till the face of the master ring matches with the small end of the L_1 and L_9 gauges. The dial readings shall be recorded and compared with the set value as in (a). The difference shall be maximum MI 1 (*see* Fig. 10).

c) To set the plain taper truncation plug gauge (Gauge C) engage the master ring shown in fig. 13 on to the plug gauge. Set the plunger tip of the dial indicator against the face 'Y' of the Master Ring and adjust the dial reading at zero ensuring that the whole millimeter reading on the small dial is identical to that on the small dials of the two gauges as given in A-6(a).

d) Repeat Step (b).

e) Screw the taper thread plug gauge *A* in to the internal thread to be gauged. The reading should be zero ± A-6(e) (*see* Table 14 for value) mm for the purpose of acceptability of the thread size. Note the reading on the dial indicator as $R_{(\mathrm{Int})L1}$

f) Screw the taper thread plug gauge *B* in to the internal thread being gauged. The reading on the dial indicator should be

(*see* Table 14 for value) for the purpose of acceptability of meeting the requirement of relative engagement (*see* **4.5**).

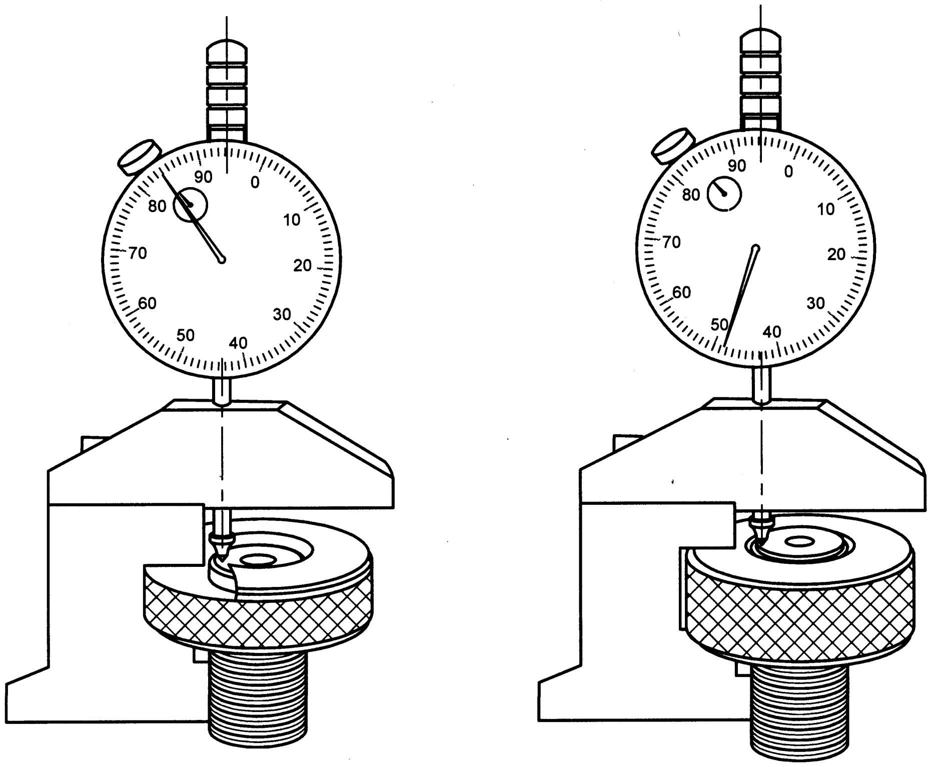
g) Place the plain taper plug gauge *C* in to the internal thread being gauged. The reading on the dial indicator should be $\mathrm{R}_{(\mathrm{Int})\mathrm{L1}}{}^{+\mathrm{A}-6(\mathrm{d})1}_{-0}$ (*see* Table 14 for value) for the purpose of acceptability of meeting the requirement of crest truncation of the thread.

Table 14 Acceptable Limit for Valve Stem and Cylinder Neck

(*clauses* A-2 and A-6)

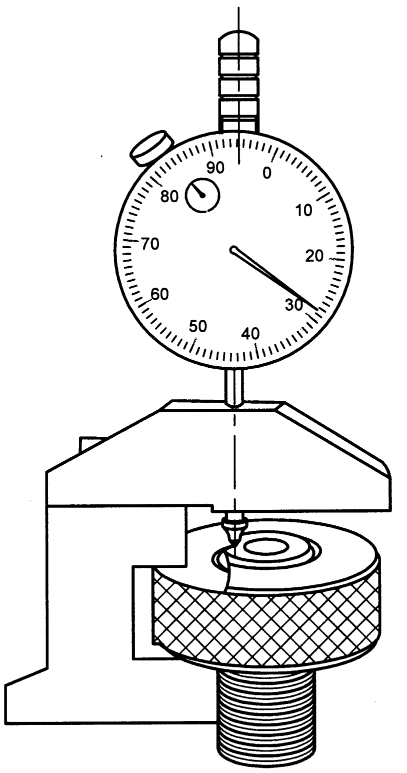
All dimensions in millimetres.

		Value of Parameters for Each Size									
Sl No.	**Parameters**	Size ⅛ – 27 NGT Thread	Size ¼ - 18 NGT Thread	Size ⅜ - 18 NGT Thread	Size ½ - 14 NGT Thread	Size ¾ - 14 NGT Thread $\mathrm{R}_{(\mathrm{Int})\mathrm{L1}}{}^{+\mathrm{A}-6(\mathrm{c})1}_{-0}$	Size ¾ - 14 NGT CL-1 Thread	Size ¾ - 14 NGT CL-2 Thread	Size ¾ - 14 NGT CL-3 Thread	Size ¾ - 14 NGT CL-4 Thread	Size 1 – 11½ NGT Thread
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i)	A-3(e)	0.941	1.411	1.411	1.814	1.814	1.814	1.814	1.814	1.814	2.21
ii)	A-3(f)	0.941	1.411	1.411	1.814	1.814	1.814	1.814	1.814	1.814	2.21
iii)	A-3(g)	1.90	2.48	2.48	2.6	2.6	2.6	2.6	2.6	2.6	2.76
iv)	A-6(e)	0.941	1.411	1.411	1.814	1.814	1.814	*See* Note Below Table 2			2.21
v)	A-6(f)	0.941	1.411	1.411	1.814	1.814	1.814				2.21
vi)	A-6(g)	1.90	2.48	2.48	2.61	2.61	2.61				2.76



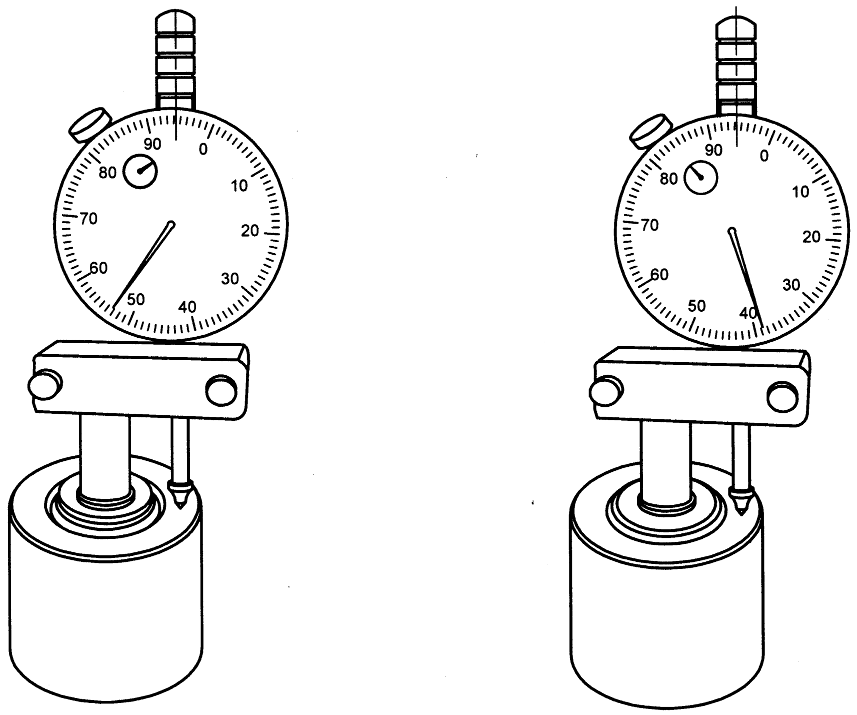
Gauging Set up for L_1 Gauge

Gauging Set up for L_8 Gauge



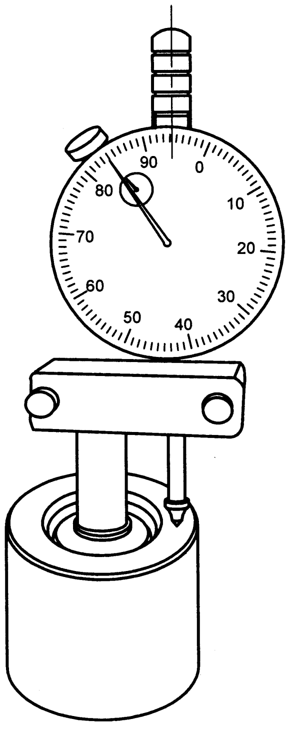
Master Plug Gauge to Check Gauge ‘F’

FIG. 14 GAUGING SET UP TO CHECK EXTERNAL TAPER THREADS ON VALVE STEM



Plug Gauge A - L_1

Plug Gauge B - L_9



Trancation Gauge ‘C’

FIG. 15 GAUGING SET UP TO CHECK INTERNAL TAPER THREADS IN CYLINDER NECK

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

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